

S
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H32

champion

STATE DOCUMENTS

DATE RECD. R/W		APR 3 1968	
Act	Info	MAIL ROUTE	Initial
1	69 Chief R/W Agent		
2	61 Sr. Asst. Chief R/W Agent		
3	62 Plan & Program		
4	63 Appraisal		
5	64 Negotiation		
6	65 Utility		
7	66 Land & Records		
8	JRR		
9	LIBRARY		
PLEASE FILE			
General File		Project	
Parcel		Utility	

montana
highway department

JUL 19 2006

SPOT
HAZARD
SAFETY
PROGRAM

MONTANA STATE LIBRARY
930 East Lyndale Avenue
Helena, Montana 59601

MARCH, 1966 thru MARCH, 1968

MONTANA SPOT HAZARD SAFETY PROGRAM

Montana State Library



3 0864 1003 4606 6

SAFETY PROJECTS

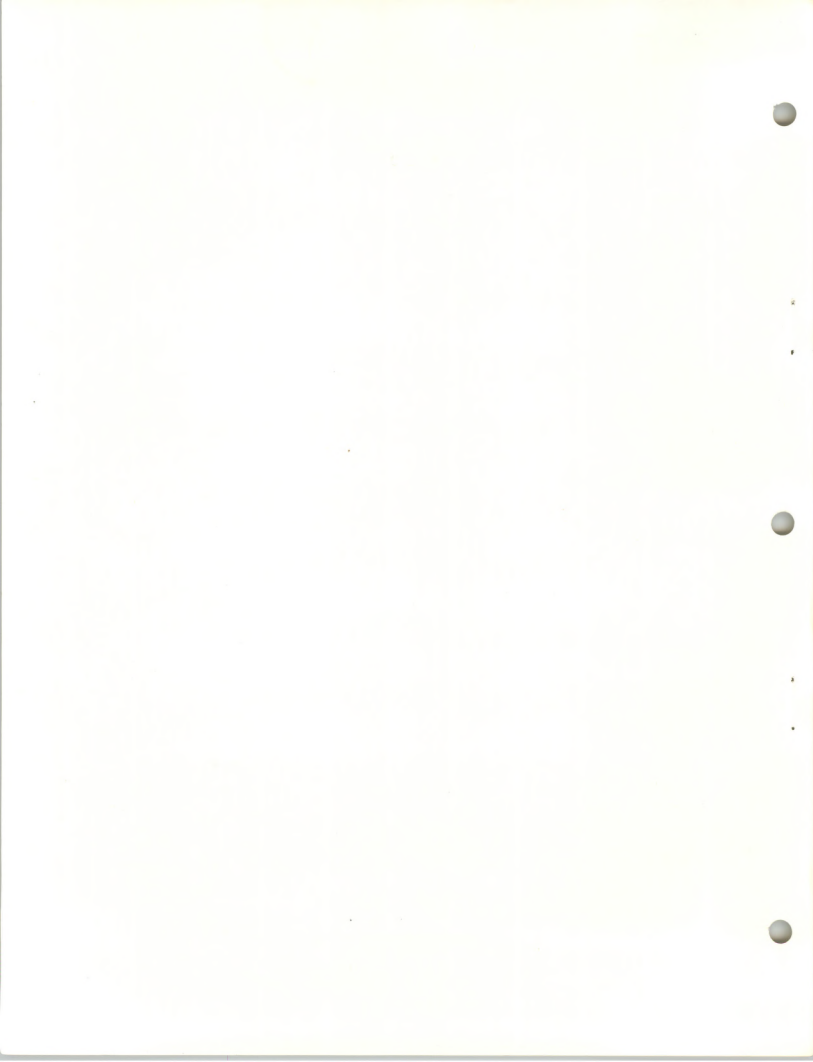
March, 1966 -- March, 1968

COMPLETE/UNDER CONTRACT

INTERSTATE - - - - -	\$167,000.00
PRIMARY - - - - -	\$3,710,700.00
SECONDARY - - - - -	\$586,970.00
URBAN - - - - -	\$89,400.00
Sub Total - - - - -	\$4,554,730.00
CHANGE ORDERS - - - - - (construction)	\$824,390.00
MAINTENANCE - - - - - (state funds)	\$75,290.00*
	\$5,454,390.00**

*Does not include expense of moving signs
back from road edges - - - statewide
**

Preliminary engineering and R/W costs + 5%
additional



SAFETY PROJECTS

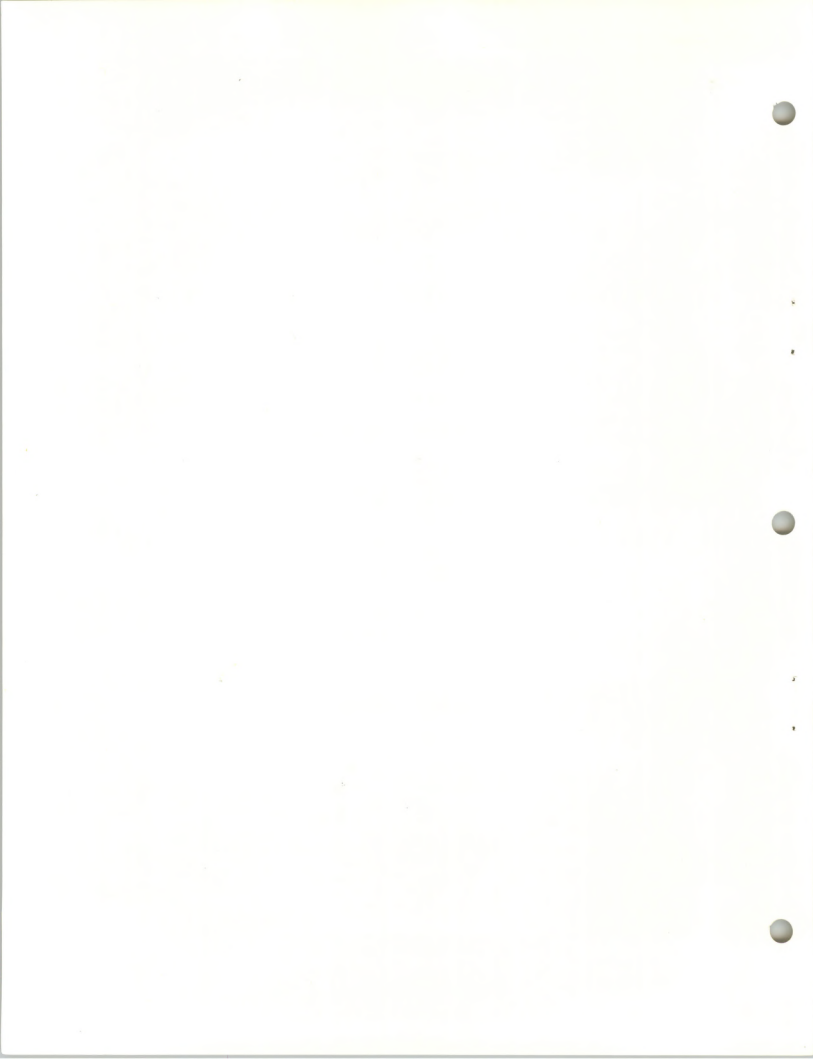
F.Y. 1968 - F.Y. 1970

PLANNED AND PROGRAMMED

INTERSTATE - - - - -	\$10,210,000.00
PRIMARY - - - - -	\$3,573,000.00
PRIMARY - URBAN - - - - -	\$2,500,000.00
SECONDARY - - - - -	\$2,072,660.00
	\$807,600.00

TOTAL - ~~\$17,055,600.00~~
\$18,358,660.00

Maintenance - - - - - Continuing program
budgeted each year;
based on field requests
and available money



Guard rail mounting height has been increased from 24 inches to 27 inches from the edge of the shoulder. Shoulders also are two feet wider where guard rails are employed.

As often as possible, overhead signs are placed on existing bridge structures. When installations are required, sign structures are located no closer than 30' from driving lanes. Overhead sign structures often have as much as 140 feet of span -- necessary to keep the supporting legs sufficiently removed from the roadway.

Design concepts on new bridges result in structures wider than the roadway plus the shoulder -- this takes care of the 2-foot set-back for guard rails used.

Bridge ends are protected by guard rail approach lanes.

Bridge curbs have been re-designed.

On overpasses or bridges with narrow medians, guard rails are provided; bridge abutments are guard rail-protected.

Large trees and boulders -- ^{all} heavy, lethal objects -- are removed from roadway if found to be closer than 30 feet.

Culverts and drop inlets have been re-designed for safety (flush type/median inlets are used).

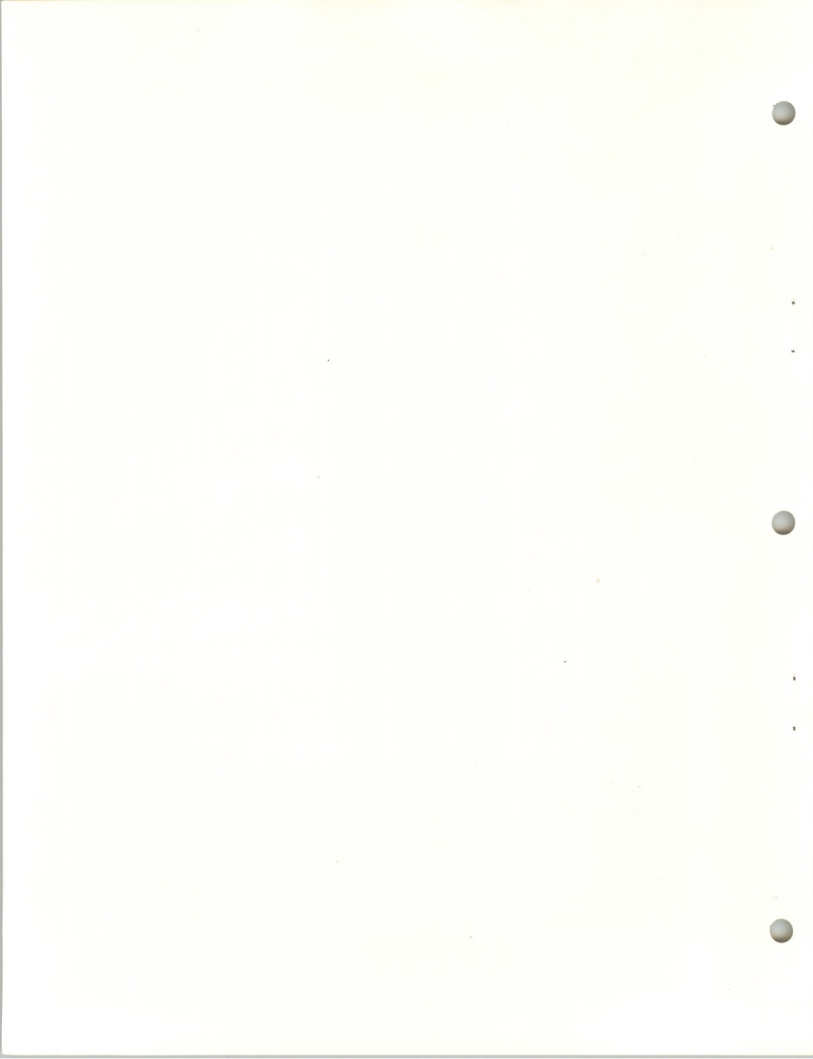
Median turn-arounds now incorporate the flatter profile -- 10-to-1 slope.

Ditch block and road approachers have the 10-to-1 slope.

Chain link access control fence is used at bridge thresholds.

Interstate highways are fenced 100%.

At-grade approaches will not be designed into 4-lane Interstate highways.



SAFETY DESIGN FEATURES IN NEW HIGHWAY CONSTRUCTION

Must provide a roadside which is clear of obstructions in the event a driver inadvertently runs off the driving lane.

Sign posts, or supports, now made "breakaway" in design and construction.

All such posts are set further out from the edge of roadway: the limit is 30' from driving lane.

If posts or supports must be located closer to driving lane than 30', they are protected by guard rails.

Lighting fixture supports are made of tapered aluminum tube. These are actually "breakaway" because of their high bending stress and low shear ~~stress~~ nature. As fixture supports, these, too, must be located no closer than 30' to driving lanes.

Lighting fixtures are mounted 45' high for more effective light dispersal; the mounting specification also results in reducing the number of fixture poles needed along the roadway.

Utility poles, where needed, are located 30' from driving lane.

Ditches, too, are restricted to 30' from driving lane.

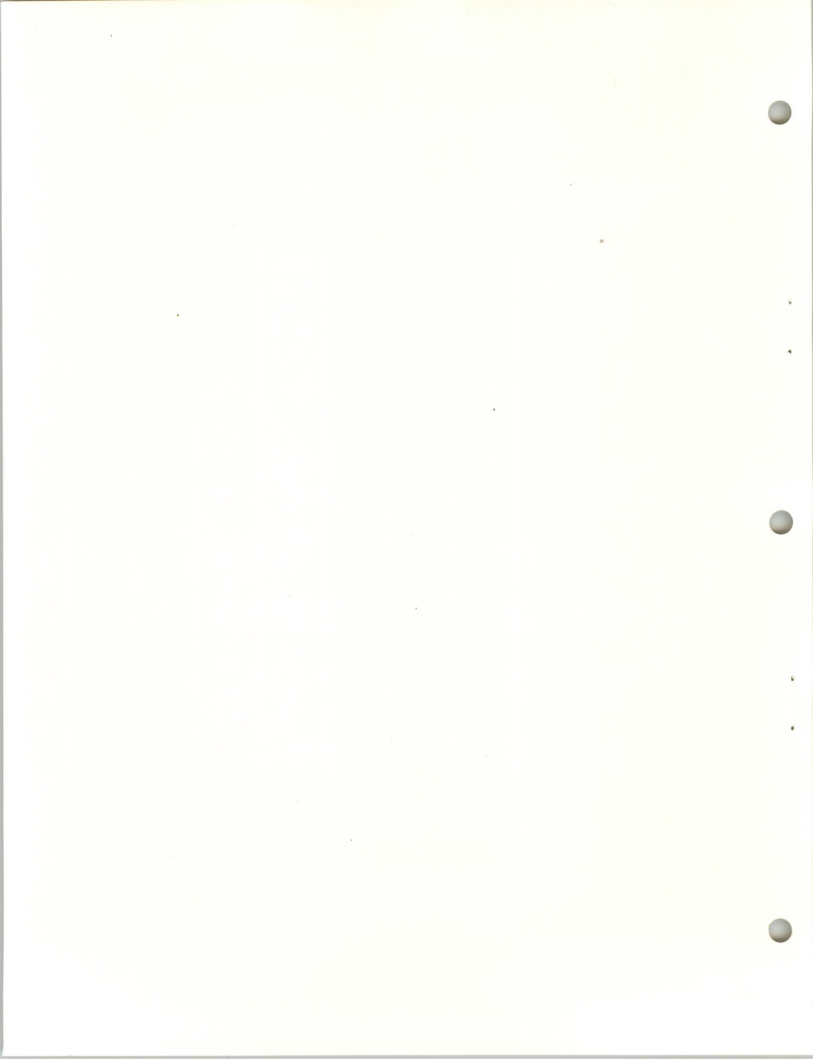
Highway shoulders today have the flatter 6-to-1 slope, instead of the older 4-to-1 or 5-to-1 slope.

Where guard rails are provided, new design requires that they have flaired ends facing oncoming traffic -- flaired, buried and anchored in the ground. (It is impossible for a car to be impaled on the flaired-end guard rail).

The first 100 feet and last 100 feet of guard rail are supported by closer post spacing to insure greater strength.

New concepts of mounting guard rail require that the rail be blocked-out from the supporting posts.

Additionally, guard rails now are provided with stronger washers to prevent their pulling out under crash stresses.



DETAILED SUMMARY

SAFETY PROJECTS

complete/under contract

3/66 thru 3/68



PRIMARY SYSTEMSAFETY IMPROVEMENT PROJECTS LET TO CONTRACT OR COMPLETED AS OF 3/7/68

Project	LOCATION & DESCRIPTION	Date	Amount
F 8(14)	7 to 12 mls. West of Harlowton; Eliminate narrow bridges and flatten curves	4-66	\$504,323
F 8(15)	Harlowton-West 7 mi., eliminate narrow bridges and improve Vertical and Horizontal alignment	10-66	719,968
F 26(8)	Jct. U.S. 87 & 19 & 20 -No. of Grass Range Install flashing beacon in advance of intersection	3-67	803
F 33(7)	Jct. U.S. 12 & 87 - W. of Roundup. Install flashing beacon in advance of intersection.	3-67	4,909
F 43(24)	Wisdom - Divide Delineate curved section along entire 50.6 mi.	10-67	10,275
F 47(5)	Jct. FA 27 & 323 in Ekalaka Advance flashing beacon	11-67	1,895
F 64(12)	Jct. U.S. 87 & 89 - 1 mi. W. of Belt Channelization, lighting & signing of Jct.	2-67	46,726
F 73(5)	Near Riceville toward Armington Constructing 1.9 mi. of truck climbing lane	9-67	44,478
F 86(32)	No. Dak. Line W. toward Baker Improve vertical and horizontal alignment to eliminate sharp curves	10-66	181,751
F 102(4)	Jct. 2 mls. No. of Big Fork Install advance warning beacon and new signs	2-67	2,444
F 148(11)	5 Mi. N.W. Hinsdale-U.S. 2 Install guardrail at 3 bridge structures	10-67	10,597
F 108(13)	U.S. 87-20 Mi. N. of Billings M. Eliminate "S" curves	9-67	359,141
F 158(9)	4.5 Mi. W. of Terry Eliminate steep grades & sharp curves	3-66	168,988
F 190(9)	U.S. 89- 4 mi. N. W. Blackfoot Reservation Fencing for safety	7-67	1,429
F 198(8)	Intersection 3 mi. N.W. of Broadus Improve intersection flashing light	11-67	45,253
F 214(6)	Prospect & Montana-Helena Install overhead signing	10-66	6,106

F 217(19)	U.S. 89 Jct. 4 mi. S. of Livingston Correct adverse super-elevation at Bridge Appr.	11-67	11,840
F 219(24)	Broadway & Van Buren-Missoula Install median island for channelization	5-67	3,827
F 219(29)	U.S. 10 and Reserve St.-Missoula Install highway lighting	10-67	6,275
F 235(34)	Highway 191-S7 W. of Moore Install flasher, sign, delineators	3-67	1,703
F 238(11)	Bowman's Corner-Inter. #287 & 20 Daylight intersection for sight distance	2-67	24,273
F 246(18)	Bridge 3 mi. E. Circle Widen bridge, sign, guard rail	9-67	60,064
F 247(20)	SR 20- 2.5 mi. E. Van Norman Widen & straighten two curves	6-67	195,423
F 256(27)	SR 20- 2 to 5 mi. NE Grass Range Elim. 2 narrow bridges w/culverts and 1 new bridge	6-67	160,803
F 257(21)	Hungrey Horse-Corin Sign improvements and approaches	2-68	11,587
F 270(12)	2 Mi. S. Whitefish Jct. Install lighting, traffic light, sign, improve intersection	2-67	8,608
F 333(33)	21 Mi. N. Grass Range Jct. 19-191 Install advance flashing beacon	3-67	2,333
F 387(11)	12 Mi. S. Twin Bridges Widen & improve shoulders	12-67	1,375
FG 86(30)	Baker East 5.3 mi. New & wider R.R. o'pass and approaches	5-67	285,378
FG 280(1)	B&P & Utah Ave.-Butte R.R. flash signal & gates	12-67	14,080
F 43(25)	Divide East New & wider bridge - reduce curve	11-67	661,354
F 47(5)	Jct. SR 7 & 227-Ekalaka Traffic Signals	11-67	1,895
F 198(8)	Jct. U.S. 212 & 312- 3 mi. N. Broadus Traffic signal, revise intersection	11-67	45,253
F 106(12)	Jct. Rtes. 28 & 4 at Rockvale Intersection improvement	2-67	45,435
F 9999(5)	Missoula Streets Intersection signal improvements	12-67	60,071

INTERSTATE SYSTEMSAFETY IMPROVEMENT PROJECTS LET TO CONTRACT OR COMPLETED - 3/7/68

<u>PROJECT</u>	<u>LOCATION AND DESCRIPTION</u>	<u>AWARD DATE</u>	<u>AMOUNT</u>
I 15-4(35)184	Capitol Interchange - Helena Safety Lighting	Aug. '67	52,916
I 90-2(40)102	Grant Creek Interchange - Missoula Safety Lighting	Sept. '67	17,795
I 90-2(41)104	Orange Street Interchange - Missoula Safety Lighting	Sept. '67	15,970
I 90-7(19)346	Near Springdale Remove Median Curb and Install Double Median Guard rail	Sept. '67	80,978



SECONDARY SYSTEM

SAFETY IMPROVEMENT PROJECTS LET TO CONTRACT OR COMPLETED - 3/7/63

PROJECT	LOCATION AND DESCRIPTION	AWARD DATE	AMOUNT
S 9 (12)	Horizontal, Vertical Curves hazards reduced 5 Mi. N.E. Cardwell State 281	Aug. '66	5,500
S 167 (7)	1 Mi. S. Cardwell, New & Wider Br. & Apprs.	July '66	186,529
S 218 (10)	Intersect. Russell & Third, Missoula Widen Intersection, Signals	Dec. '67	20,938
S 222(6)	Jct. at Gildford 5.781 Mi. N. New & Wider Bridge & Approaches	Aug. '67	74,534
S 224 (10)	Reserve & U.S. 10, Missoula Lighting for Safety	Oct. '67	12,505
S 323 (14)	8 Mi. SW Jct. FA 2 & 315 W. of Forsyth New & Wider Bridge & Approaches	Apr. '67	160,960
S 332 (7)	G.N. X-ing & Sargent St., Nashua R.R. Signal W/Flashing Light	Apr. '67	11,050
SG 178 (7)	N.P. X-ing Near Moiese & Charlo 2 R.R. Signals W/Flashing Light	July '66	20,045
SC 306 (7)	N.P. X-ing 6 Mi. W. of Ronan R.R. Signal W/Flashing Light	Jan. '66	10,920
SG 355 (6)	G.N. X-ing at Jobbin R.R. Signal Gates & Flashing Light	Mar. '67	8,970
S 2 (18)	Helena (Flesh Pass) Lincoln Guard Rail	Feb. '66	30,671
S 000S (1)	Oiled Secondary Highways Signing L & C Co.	May '67	22,215
S 000S (2)	Oiled Secondary Highway Signing L & C Co.	June '67	22,100

SAFETY IMPROVEMENT PROJECTS LET TO CONTRACT OR COMPLETED - 3/7/68

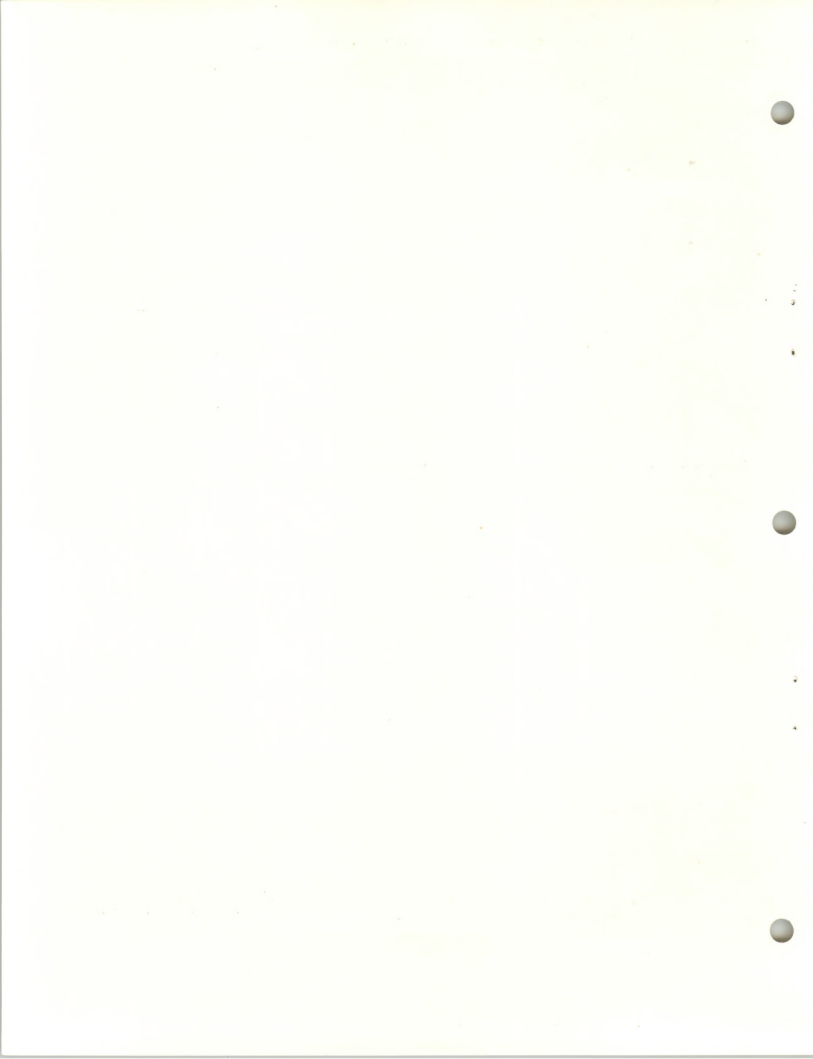
URBAN SYSTEM

PROJECT	LOCATION AND DESCRIPTION	AWARD DATE	AMOUNT
U 249 (17)	Euclid Avenue, Helena School Stop Light & Channelization	Oct. '66	7,963
U 277 (7)	10th Ave. S. & 57th Street, Great Falls Install Signs, Channelization, Lighting	Feb. '67	68,910
U 386 (8)	First Avenue N. & 13th, Billings Install Lights, Signal, Channelization	Aug. '67	12,503

DETAILED SUMMARY

SAFETY PROJECTS

planned thru F.Y. 1970



INTERSTATE SYSTEM SAFETY PROJECTS - PLANNED

<u>PROJECT</u>	<u>DESCRIPTION</u>	<u>AMOUNT</u>
	(Inventory and Alleviation of Safety Hazards on completed 4-lane sections) To include: Signs, Lighting Poles, Pavement Markings, Wrong-way Control at Ramps and Transitions, Approaches to Ramps Revised, Slick Pavements, Curb and Drainage Structures, Bridge the openings on junior-grade separations and other structures, Headlight glare, All structures for unprotected hazards, Any other hazardous condition.	
I 90-2(42)	Missoula West - Clinton	\$ 340,000
I 90-8 ()	Park City - Pinehill	\$ 850,000
I 15-4 ()	So. Lewis & Clark Co. Line - Wolf Creek	\$ 2,550,000
	Proposed remainder of State	\$ 5,740,000
	Proposed lighting interchanges (Statewide)	\$ 733,000



PRIMARY SYSTEM SAFETY PROJECTS PLANNED THRU 1970 P. Y.

Project	DESCRIPTION	Est. Cost
F 257()	Signing, Delineation and Jct. Impro-Hungry Horse-Corun	\$ 10,000
F 194	Improve and Realign Jct near St. Ignatius	40,000
F 257()	Improve road intersection East of Columbia Falls	20,000
F 263()	Guardrail and alignment improv-Stoyker-Eureka	100,000
F 190(10)	Intermittent guardrail- Birch Creek-Browning	30,000
F 210()	Ramps to stop runaway trucks near St. Mary's	15,000
F 196()	Lighting and Signing - Browning Wye	20,000
F 252()	Realign curves near Box Elder and Big Sandy	250,000
F 333()	Fencing south of Malta	20,000
F 245()	Signalize Jct. near Sidney	5,000
F 245()	Improve R.R. x-ing near Savage	5,000
F 149()	Impro Jct and Signalize Jct, Smelter Avenue, Great Falls	150,000
F 235()	Replace narrow bridge and realign curve near Hobson	200,000
F 248()	Replace narrow bridges and improve Jct west Three Forks	400,000
F 88()	Guardrail, delineation and widening west of Dixon	300,000
F 186()	Realign and widen S. W. of Perma	1,000,000
F 184()	Signal at R.R. x-ing 3 Mi. W. of Garrison	3,000
F 241()	Realign, sign and delineate No. of Dillon	150,000
F 45()	Realign and widen No. of Big Timber	350,000
F 81()	Jct improvement E. of White Sulphur Springs	5,000
U 386()	Improve Jct 1st Ave. and State Street, Billings	200,000
F 53()	Billings Heights and N. W. Fairgrounds lighting	150,000
F 138()	Realign curve N. of Roundup	150,000
F 9999()	Statewide Signing and Signals - Uniform Std's	<u>2,500,000</u>
Total		\$6,073,000

Tentative Construction Program
SECONDARY SYSTEM SAFETY PROJECTS
Fiscal Years 1968 - 69 - 70

PROJECT	DESCRIPTION
Safety	Lincoln County; County Wide; Signs (Work by County)
"	Flathead County; County Wide; Signs (Work by County)
"	Hill County; County Wide; (Work by County) Signs
"	Blaine County; County Wide; Signs (Work by County)
"	Glacier County; County Wide; Signs (Work by County)
"	Liberty County; County Wide; Signs (Work by County)
"	Toole County; County Wide; Signs (Work by County)
"	Roosevelt County; County Wide; Signs (Work by County)
"	Valley County; County Wide; Signs (Work by County)
"	Phillips County; County Wide; Signs (Work by County)
"	Sheridan County; County Wide; Signs (Work by County)
"	Daniels County; County Wide; Signs (Work by County)
"	Dawson County; County Wide; Signs (Work by County)
"	Prairie County; County Wide; Signs (Work by County)
"	Richland County; County Wide; Signs (Work by County)
"	Fergus County; County Wide; Signs (Work by County)
"	Arrow Creek-Brooks; Brooks West; Strs. -Widen 4 & 1 New
"	Chateau County; County Wide; Signs (Work by County)
"	Judith Basin County; County Wide; Signs (Work by County)
"	Pondera County; County Wide; Signs (Work by County)
"	Teton County; County Wide; Signs (Work by County)

PROJECT	DESCRIPTION
Safety	Broadwater County; County Wide; Signs (Work by County)
"	Jefferson County; County Wide; Signs (Work by County)
"	Sanders County; County Wide; Signs (Work by County)
"	Powell County; County Wide; Signs (Work by County)
"	Missoula County; County Wide; Signs (Work by County)
"	Granite County; County Wide; Signs (Work by County)
"	Mineral County; County Wide; Signs (Work by County)
"	Ravalli County; County Wide; Signs (Work by County)
"	Deer Lodge County; County Wide; Signs (Work by County)
"	Madison County; County Wide; Signs (Work by County)
"	Silver Bow County; County Wide; Signs (Work by County)
"	Beaverhead County; County Wide; Signs (Work by County)
"	Sweet Grass County; County Wide; Signs (Work by County)
"	Park County; County Wide; Signs (Work by County)
"	Meagher County; County Wide; Signs (Work by County)
"	Wheatland County; County Wide; Signs (Work by County)
"	Stillwater County; County Wide; Signs (Work by County)
"	Wyoming Line-Belfry; 4.5 mi. S. of Belfry; Clark Fk. Rv. Br. & Apps.
"	Big Horn County; County Wide; Signs (Work by County)

DETAILED SUMMARY

SAFETY PROJECTS

state financed complete/under contract

11/65 thru 1/68

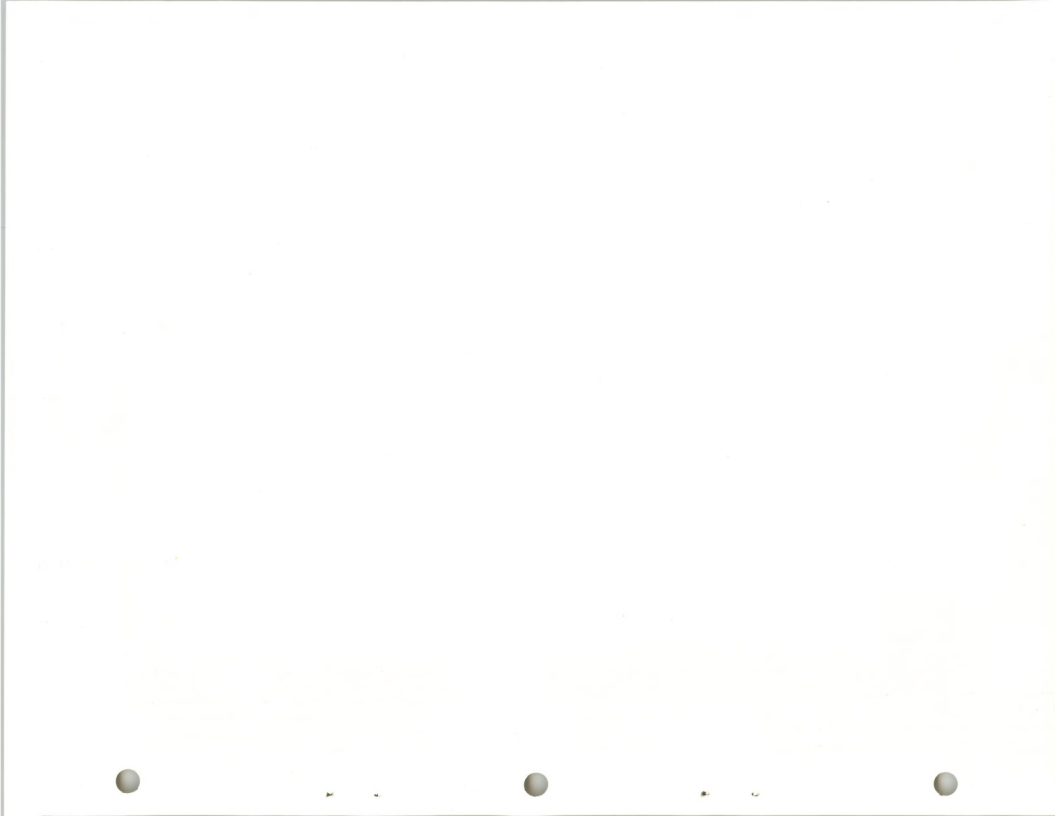
STATE _____

PERIOD: FROM _____

TO _____

Route No.	County-City	System	General Location	Type of Improvement	Cost	Inventory Reference
U.S. 312	Custer Co.	Pri.	7 mi. N. of Powder Riv. County line	Replaced 19 ft. by 19 ft. Treated timber bridge with 52 ft. of 36 in. pipe and 52 ft. of 30 in. pipe, salvaged C.M.P.	\$ 1,200	
I-15.	Beaverhead Co.	Inter.	Near Lima Scale	Removed concrete medians and striped pavement to control traffic	\$ 350	
U.S. 2	Glacier Co.	Pri.	1 mi. W. of Browning	Install 200 ft. standard guard rail with 6'3" centers and one concrete anchor	\$1,220	
U. S. 93	Lake Co.	Pri.	Ravalli	Realigned traffic island and traffic separator	\$3,480	
I-15 & I-90	Silver Bow Co.	Inter.	City of Butte	Remove appx. 6,000 cu. yds. material, make channel change, install 40' of 48" pipe, reset R/W fence to daylight curve	\$3,784	
Mont. 200	Garfield Co.	Pri.	Between Jordan & Brockway	Purchase material to have land owner erect 2 mi. of 4 wire fence	\$ 808	
Mont. 200	Garfield Co.	Pri.	Between Mosby & Sand Spgs.	57' timber treated bridge 21' wide, widen 2' on each side	\$ 806	
U.S. 312	Custer Co.	Pri.	Between Miles City & Broadus	57' timber treated bridge 19' wide widen 2' on each side	\$ 950	

*Inventory Reference - Use inventory date, page number, and line number



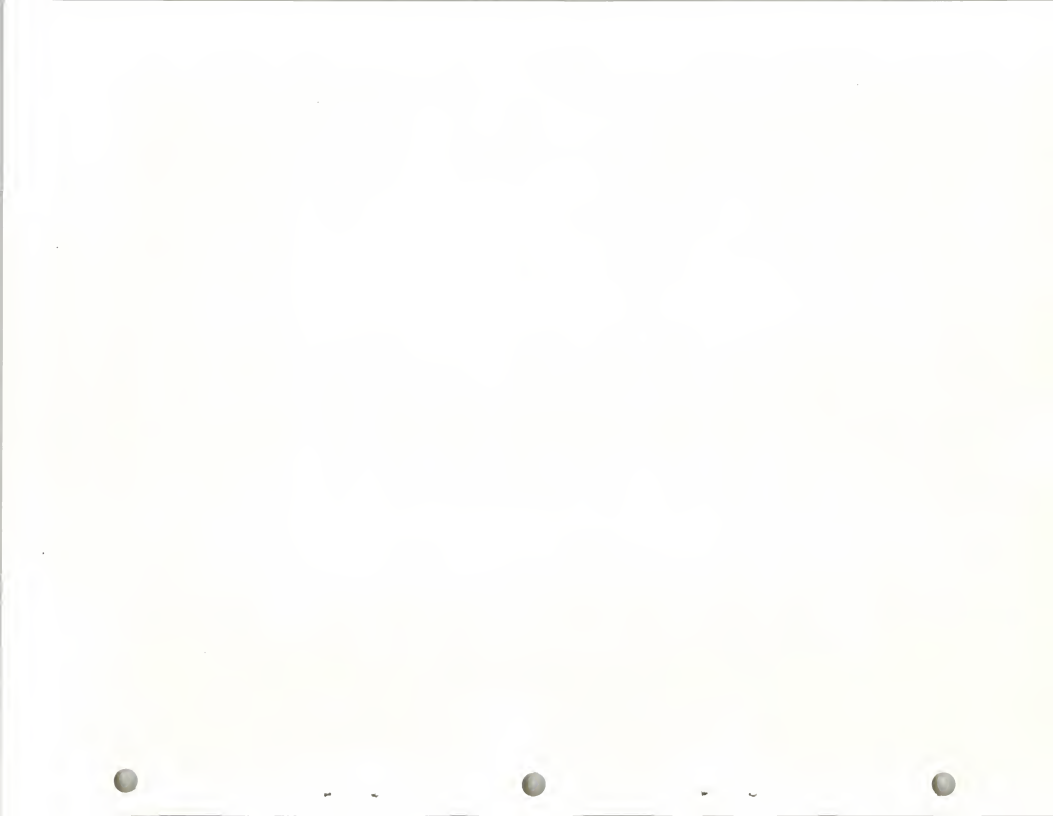
STATE

PERIOD: FROM

TO

Route No.	County-City	System	General Location	Type of Improvement	Cost	Inventory Reference
U.S. 312	Custer Co.	Pri.	Between Miles City & Broadus	57' timber treated bridge 19' wide, widen 2' on each side	\$ 648	
U.S. 312	Custer Co.	Pri.	Between Miles City & Broadus	57' timber treated bridge 19' wide, widen 2' on each side	\$ 899	
U.S. 312	Custer Co.	Pri.	Between Miles City & Broadus	38' timber treated bridge 19' wide, widen 2' on each side	\$ 418	
U.S. 312	Custer Co.	Pri.	Between Miles City & Broadus	38' timber treated bridge 19' wide, widen 2' on each side	\$ 603	
U.S. 312	Custer Co.	Pri.	Between Miles City & Broadus	95' timber treated bridge 19' wide, widen 2' on each side	\$1,638	
Mont. 35	Lake Co.	Pri.	Between Big Fork & Polson	Completed the installation of 2500' of new guard rail on east shore of Flathead Lake	\$5,650	
U.S. 312	Custer Co.	Pri.	46 mi. S. of Miles City	Road surface 2' wider Replaced bridge with culvert Replaced with culvert-widened 2'	\$ 1,000	
U.S. 2	Blaine Co.	Pri.	Between Harlem & Dodson	Replaced with culvert-widened 2' Removed 25' timber bridge	\$ 2,000	
U.S. 12	Mongher Co.	Pri.	Between White S.S. & Townsend	Widened 3 bridges 2' on each side	\$ 1,600	

*Inventory Reference - Use inventory date, page number, and line number



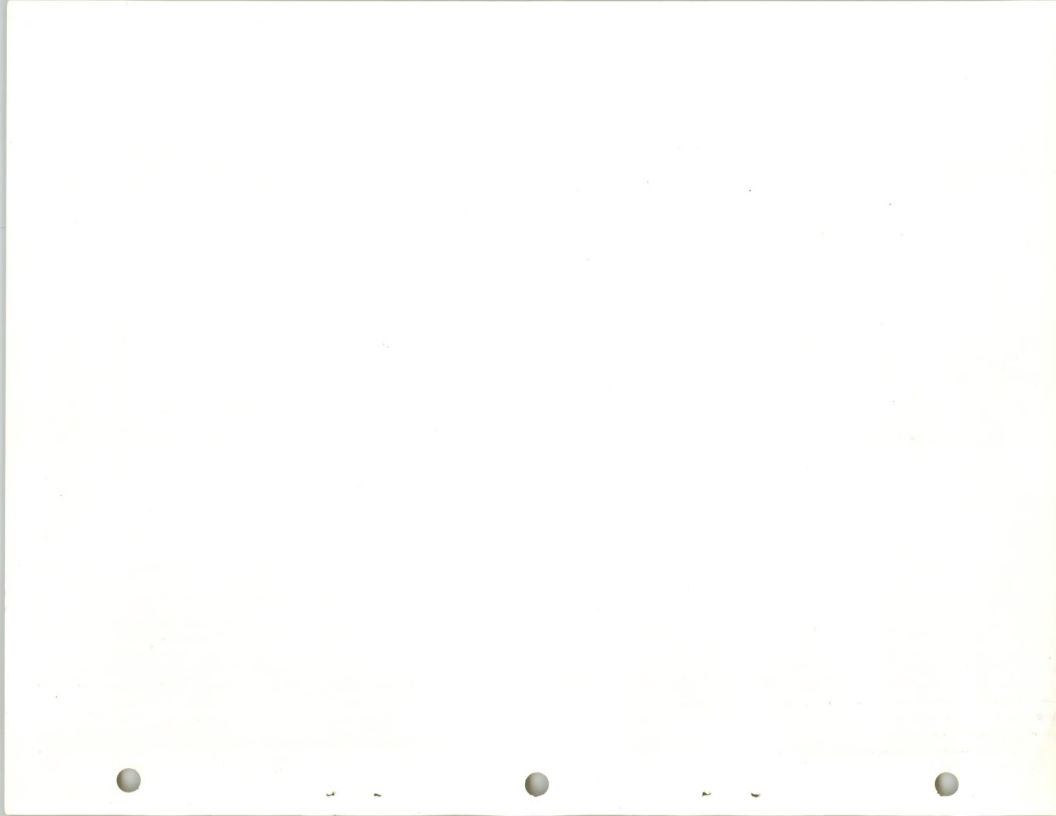
STATE

PERIOD: FROM

TO

Route No.	County-City	System	General Location	Type of Improvement	Cost	Inventory Reference
U.S. 287 & Mont. 200	L & C	Pri.	Bowman's Corner	Signs & Signals	\$ 6,200	
Mont. 35	Flathead Co.	Pri.	E. Shore Flathead Lake	2500' of new guard rail	\$ 4,200	
U.S. 287 & Mont. 200	L & C	Pri.	Bowman's Corner	Signs & Signals	\$ 3,500	
Mont. 281	Jefferson Co.	Sec.	Boulder Valley Rd.	Improving curve	\$ 4,000	
U.S. 12	L & C	Pri.	Mont. Ave. between Prospect & 11th Helena	Plastic Pavement marking	\$ 600	
U.S. 312	Custer Co.	Pri.	Miles City S.	Removed 19' X 19' T.T. Bridge & replaced it with 80' of 84 C.M.P.	\$ 2,221.91	
U.S. 93	L & C	Pri.	Wolf Creek-Cascade	Applied "codit" to portals of bridge	\$ 227.31	
U.S. 93	L & C	Pri.	Wolf Creek-Cascade	Applied "codit" to portals of bridge	\$ 230.29	
U.S. 312	Custer Co.	Pri.	Miles City S.	Widen 19' bridge 2' each side	\$ 1,100	
U.S. 12	Meagher	Pri.	White Sulphur Springs - Harlowton	Widen 9-19' bridges 2' on ea. side	\$ 3,200	
U.S. 12	Meagher	Pri.	White Sulphur Springs - Harlowton	Widen 8 - 19' bridges 2' each side	\$ 3,500	

*Inventory Reference - Use inventory date, page number, and line number



STATE _____

PERIOD: FROM _____

TO _____

Route No.	County-City	System	General Location	Type of Improvement	Cost	Inventory Reference
U.S. 312	Custer Co.	Pri.	Miles City S.	Replace 19' x 95' bridge with 80' of 96" pipe	\$ 3,500	
U.S. 312	Custer Co.	Pri.	Miles City S.	Replace 19' wide bridge with 36" C.M. pipe	\$ 1,500	
U.S. 312	Custer Co.	Pri.	Miles City S.	Widen 19' bridge 2' each side	\$1,350	
U.S. 12	Meagher Co.	Pri.	Townsend-White Sul. Spgs.	Widen 21' bridge that is on curve 2' on each side	\$ 500	
U.S. 12	Broadwater Co.	Pri.	Deep Creek Canyon	Widen 24' wide bridge 2' each side	\$ 400	
U.S. 12	Broadwater Co.	Pri.	Deep Creek Canyon	Widen 24' bridge 2' each side	\$ 400	
U.S. 12	Broadwater Co.	Pri.	Deep Creek Canyon	Widen 24' wide bridge 2' each side	\$ 400	

*Inventory Reference - Use inventory date, page number, and line number

